

Trying to measure the use of unallocated IPv4 address space

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Overview

- What's the problem?
- What are we trying to measure?
- What can't we measure?
- What are the results?
- What else?
- ¿Questions?

What's the problem?

- All unallocated unicast space **will** be allocated
- Some networks and services already use this space
- <http://www.nanog.org/mtg-0710/presentations/Vegoda-lightning.pdf>

What are we trying to measure?

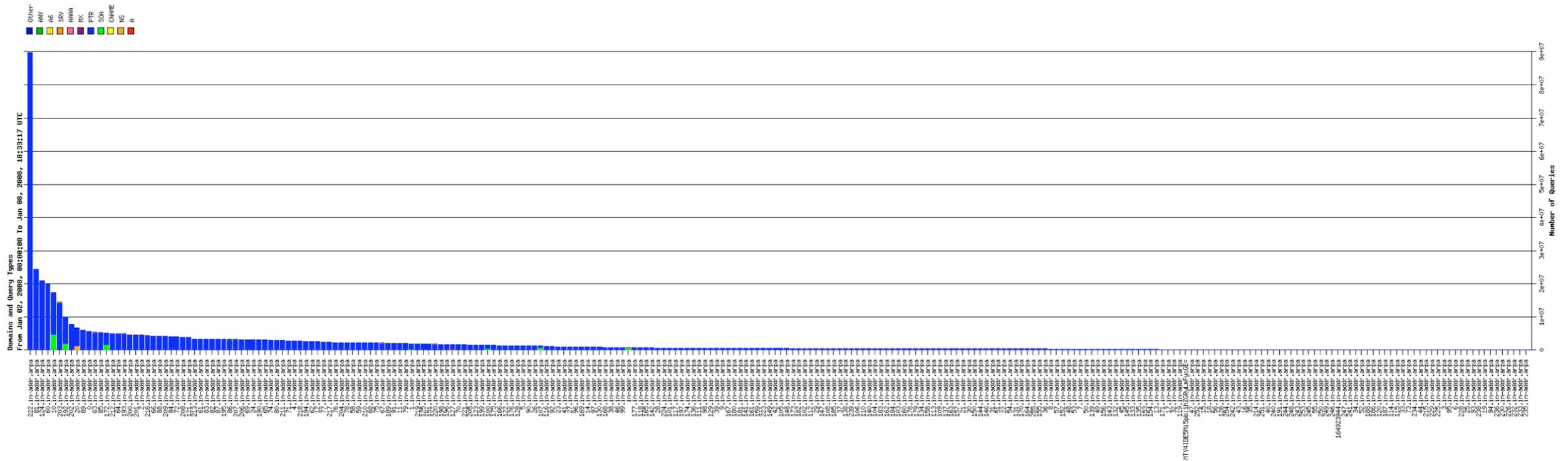
- PTR queries received at root DNS servers where the IPv4 address is not part of an allocated /8

What can't we measure?

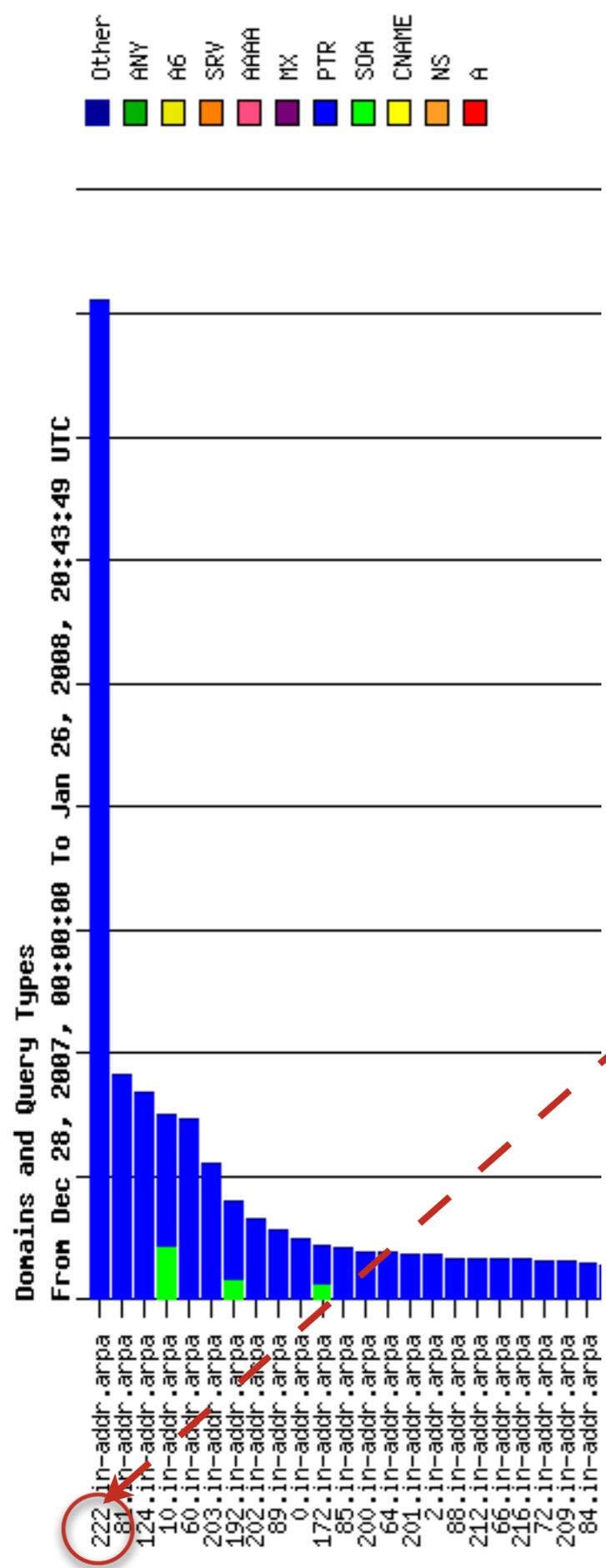
- Usage by otherwise well run sites using unallocated space
 - Split-horizon DNS
 - Egress filters

What are the results?

Let's look at the distribution for all /8s

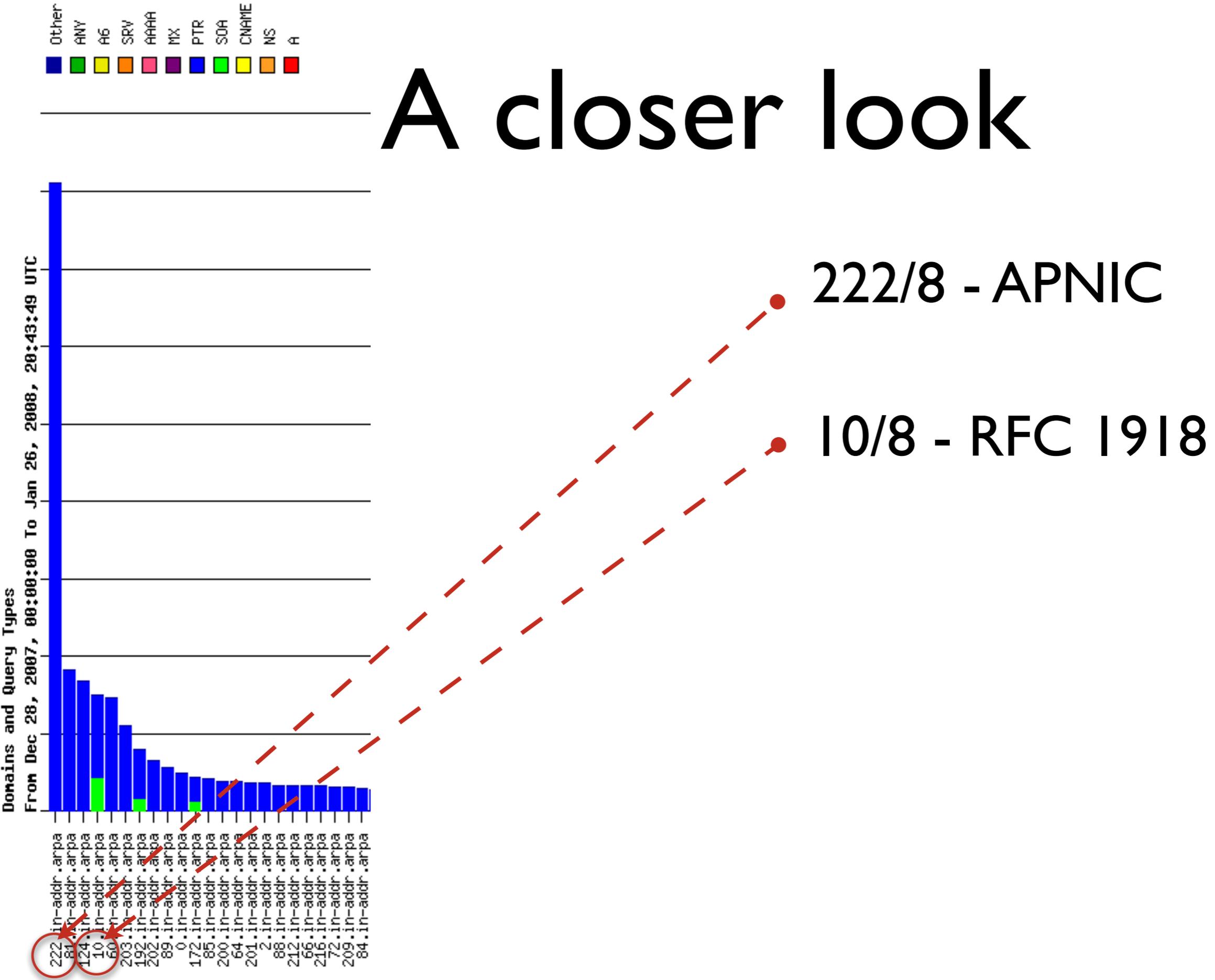


A closer look

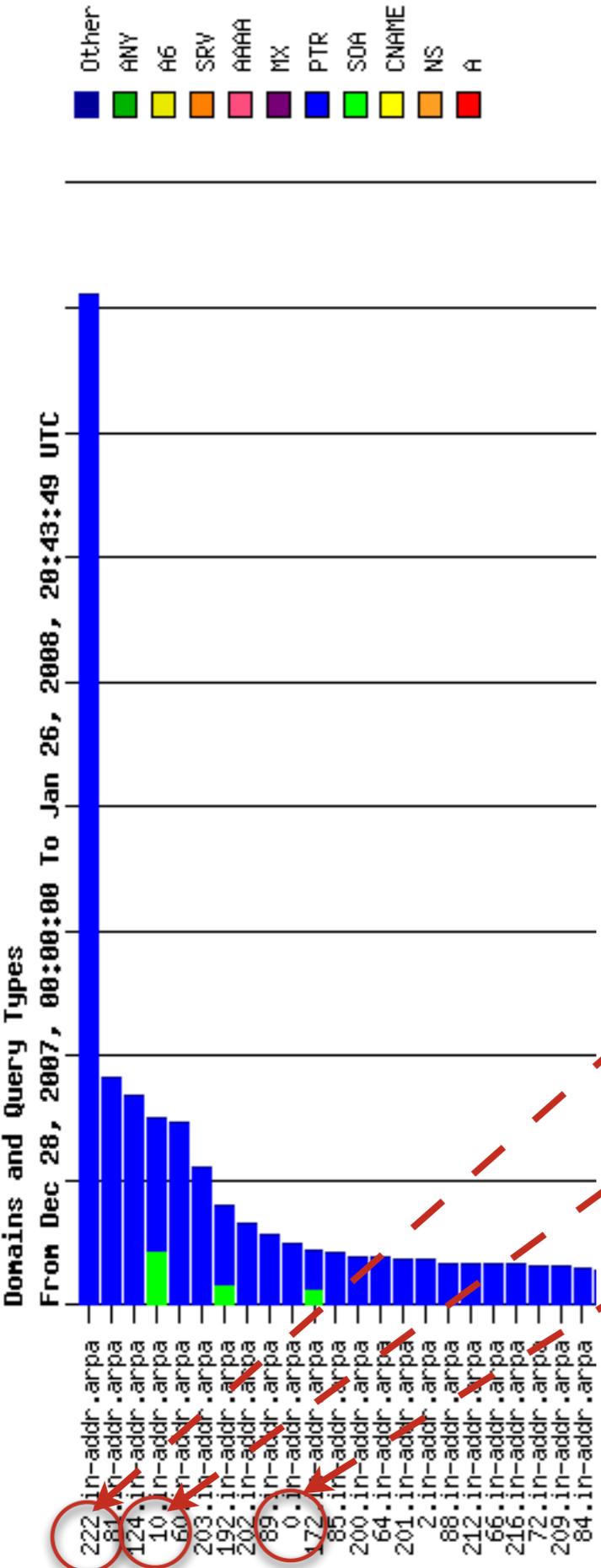


222/8 - APNIC

A closer look



A closer look

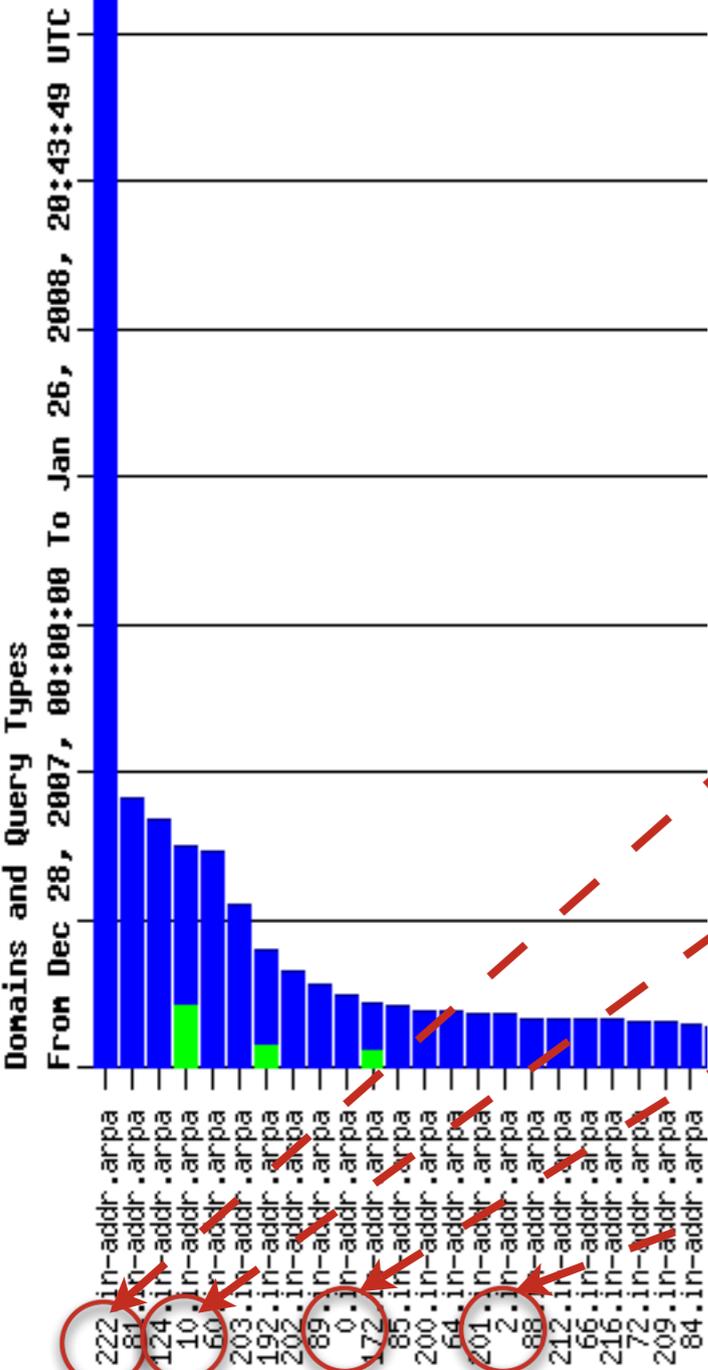


222/8 - APNIC

10/8 - RFC 1918

0/8 - RFC 3330

A closer look



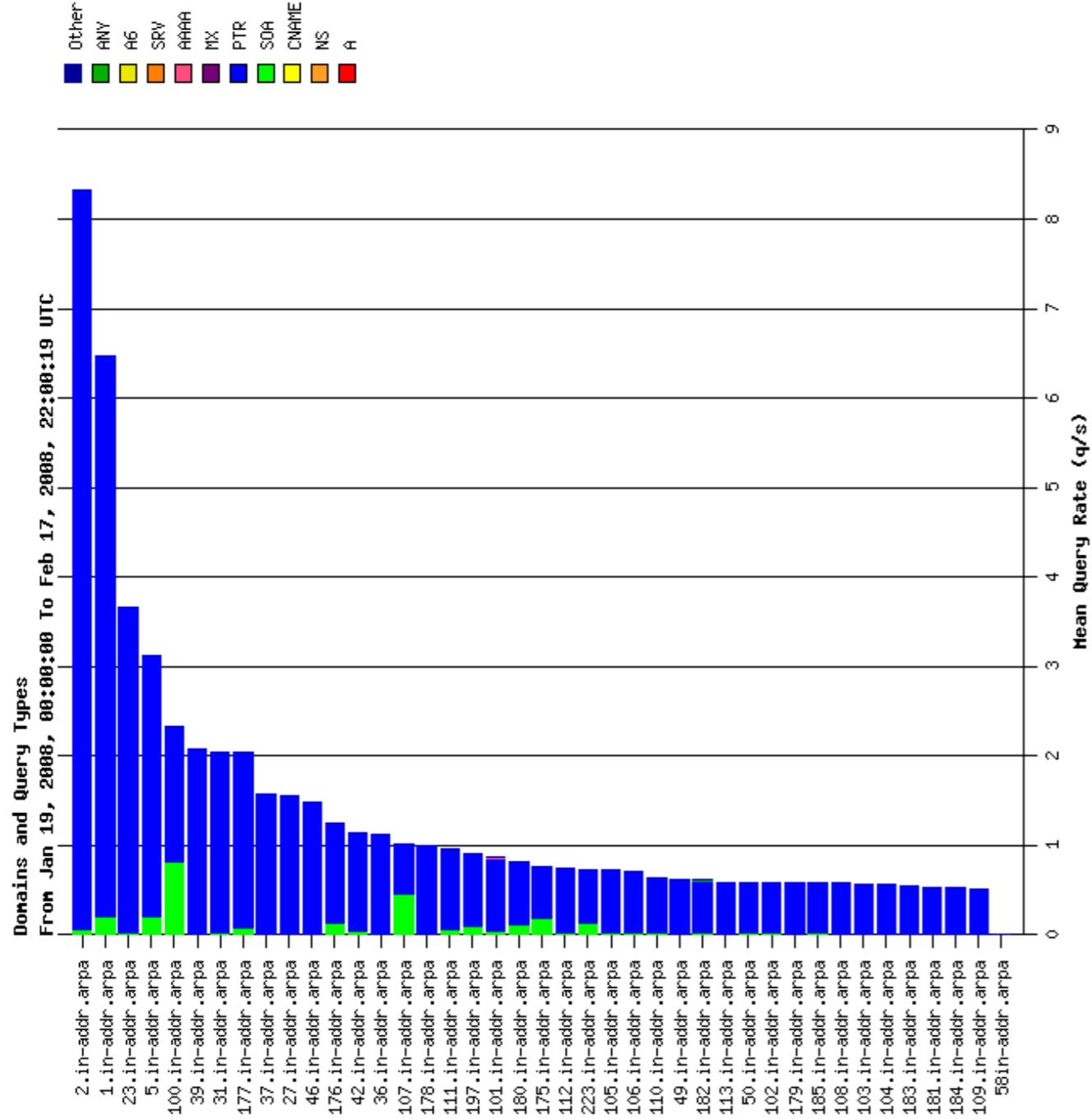
222/8 - APNIC

10/8 - RFC 1918

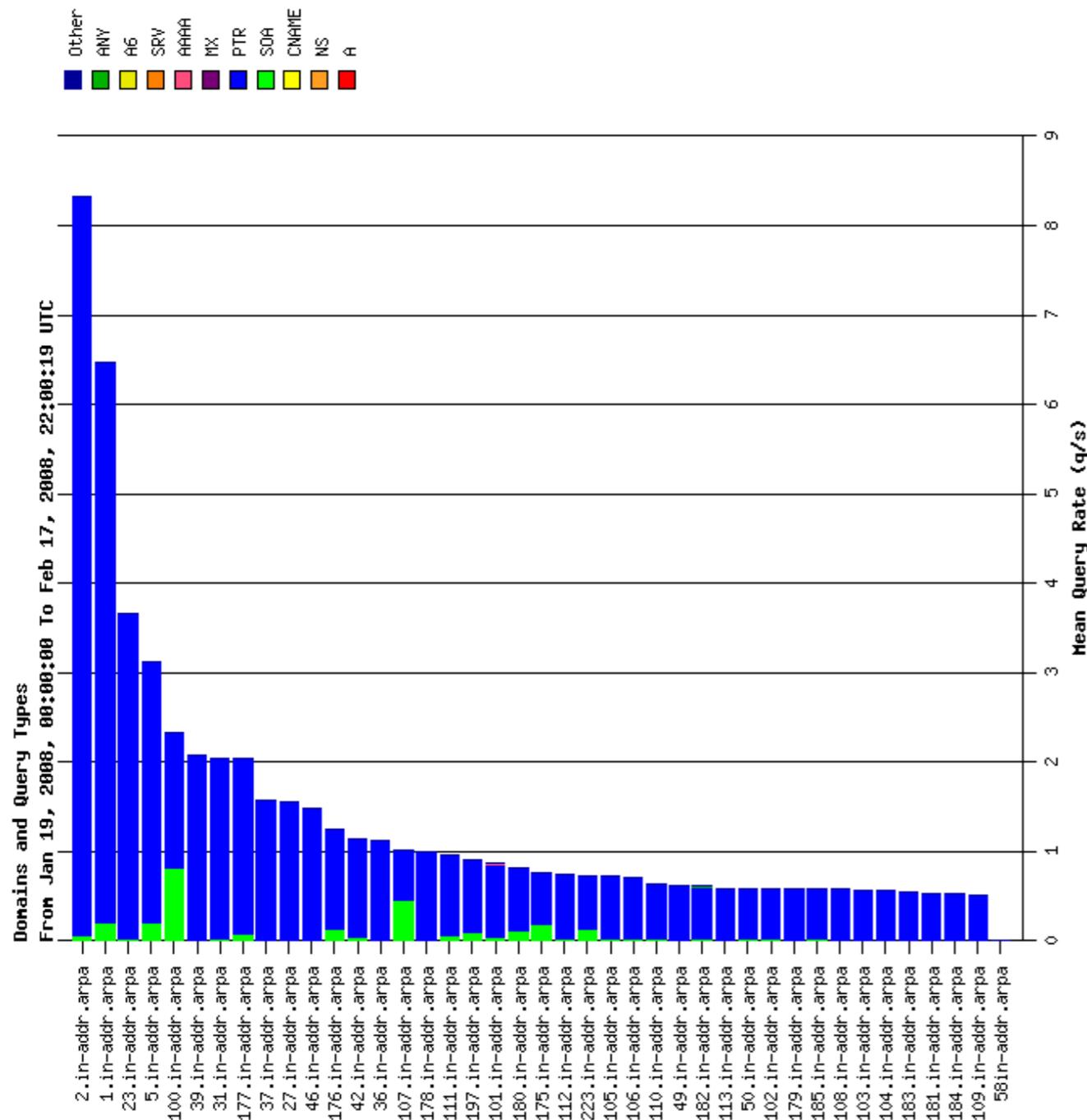
0/8 - RFC 3330

2/8 - UNALLOCATED

Query distribution over 30 days



Query distribution over 30 days



Top 10

1	2.in-addr.arpa
2	1.in-addr.arpa
3	23.in-addr.arpa
4	5.in-addr.arpa
5	100.in-addr.arpa
6	39.in-addr.arpa
7	31.in-addr.arpa
8	177.in-addr.arpa
9	37.in-addr.arpa
10	27.in-addr.arpa

How static are the data?

- The order of domains in 'Top 10' changes over time
- Domains join and leave the 'Top 10'

Changes

28 Dec - 26 Jan

Top 10	
1	2.in-addr.arpa
2	1.in-addr.arpa
3	176.in-addr.arpa
4	100.in-addr.arpa
5	27.in-addr.arpa
6	175.in-addr.arpa
7	107.in-addr.arpa
8	5.in-addr.arpa
9	23.in-addr.arpa
10	46.in-addr.arpa

19 Jan - 17 Feb

Top 10	
1	 2.in-addr.arpa
2	 1.in-addr.arpa
3	 23.in-addr.arpa
4	 5.in-addr.arpa
5	 100.in-addr.arpa
6	 39.in-addr.arpa
7	 31.in-addr.arpa
8	 177.in-addr.arpa
9	 37.in-addr.arpa
10	 27.in-addr.arpa

What don't we measure?

- Query source address and AS

But that was just L-root

- The technique seems to work
- Data from other root server operators would give a broader picture
- More analysis would be useful

¡Questions?

